

McLAUGHLIN INSTRUCTION BOOK

Light Six Models H-62 and H-63

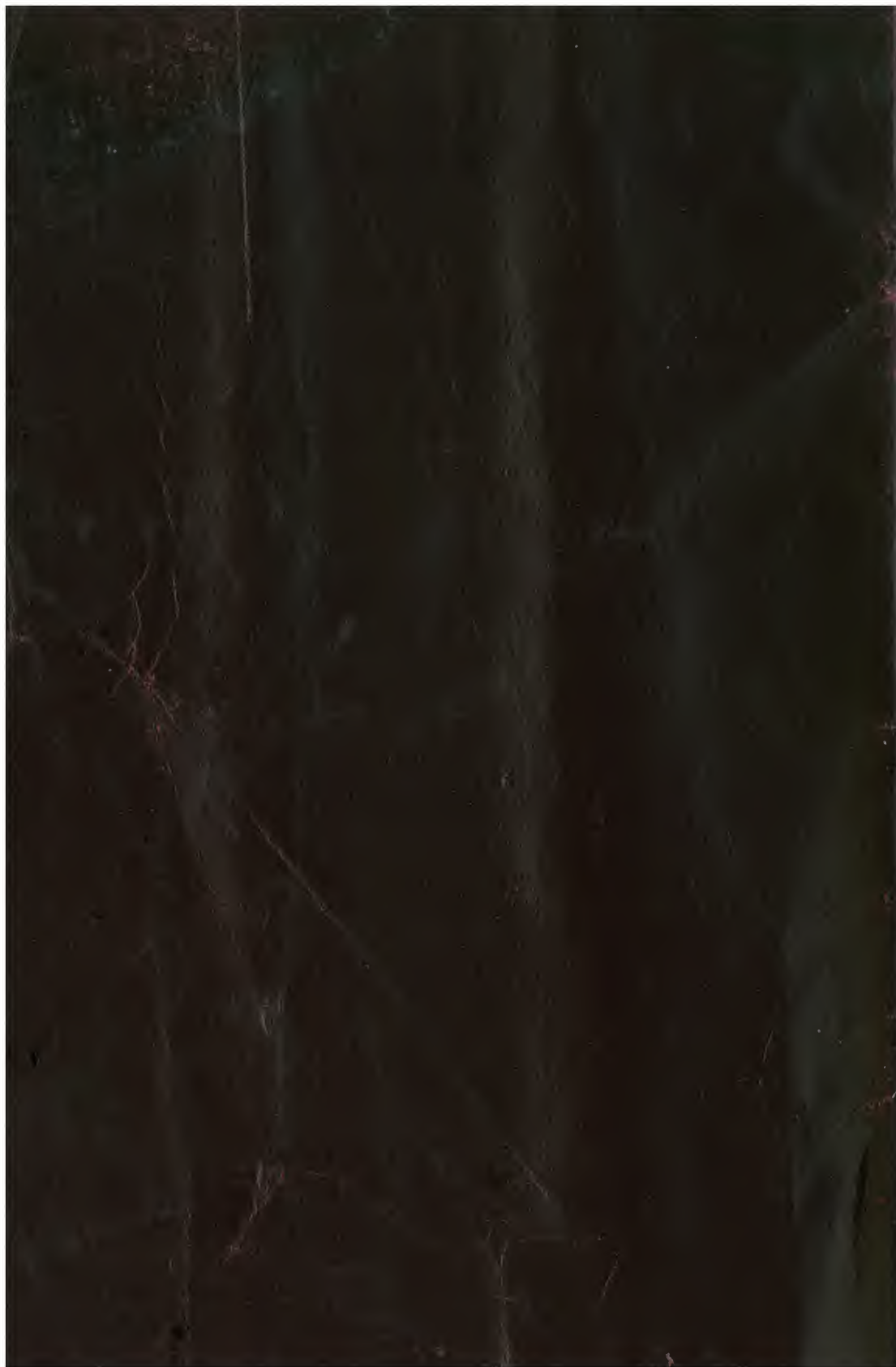
*Read Carefully and Follow
Instructions*



PRICE 25 CENTS

The McLAUGHLIN MOTOR
CAR CO., Limited

OSHAWA, ONTARIO, CANADA



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McLAUGHLIN INSTRUCTION BOOK

— *FOR* —

Model H-6-62
H-6-63

—
SIX CYLINDER

**This instruction book contains general information for the
operation and maintenance of this car. For any
further information, address all inquiries to the
Service Department of this Company.**



GENERAL INTRODUCTORY.

In presenting a book of instruction to the car owner, many phases of an unusual nature are met.

To presume too much on our part might cause some readers to feel that we have encroached on their former experience, and in this we have carefully endeavored to point out differences in design and construction for their guidance.

To the car owner who is handling his or her car for the first time we have endeavored to impart that fundamental knowledge which we believe should be acquired to insure the best of service and all of the pleasures that belong to the McLaughlin car owner.

With these ideas in mind we present this instruction book beginning with the owner's receipt of car and leading down to the time when it is necessary to order parts, for replacements, which have worn out after many miles of service.

It is inevitable that certain information will not be found in this instruction book; therefore, we request the car owner requiring such information to address their inquiries to the Service Department of this Company.

It is our intention to give satisfactory information and service to each purchaser of a McLaughlin car, and should an owner fail to receive such information and service, we ask in good faith to be so advised.

PART ONE

INTRODUCTORY.

Part one introduces the reader to the various operations that naturally come to his or her attention first, and is divided into the following list of chapters:

FIRST THINGS TO DO

(Page No. 5)

This chapter refers to various things to do when the car is shipped by freight.

MAKING READY TO RUN

(Page No. 5)

This chapter covers the subject of preparing the car to run.

OPERATING PARTS

(Page No. 6)

This chapter describes and tells the location of the operating parts.

STARTING THE ENGINE

(Page No. 7)

This chapter explains what to do to start the engine preparatory to driving the car.

OPERATING THE AUTOMOBILE

(Page No. 10)

This chapter tells how to operate the automobile.

DRIVING OPERATIONS, RULES AND SUGGESTIONS

(Page No. 11)

This chapter is a general resume of the previous chapters as a whole, appended to which are various rules for driving and good suggestions for the new driver.

PART ONE

OPERATION

FIRST THINGS TO DO

Most McLaughlin cars are received from the dealer direct, and in the event that this is not the case, note the following remarks:

Receipt of
Automobile

After receipt of bill of lading from transportation company, have freight car located opposite an unloading platform with same height as car floor.

Location of
Freight Car

If an unloading platform is not available secure two extra strong planks with side and end cleats and of such a length that the least amount of grade is secured from freight car to the ground. Place planks 56 inches apart, center to center.

Unloading
Ways

Before removing the automobile from freight car and before signing freight release, inspect all car seals and ascertain if these have been broken in transit, and if they have, make a note of the freight car name and number.

Inspection
Of Freight
Car Seals

After freight car is opened inspect the automobile carefully to see there has been no damage en route.

Inspection
Of Automobile

If there has been any damage make a note of same on receiving slip and do not sign for automobile until everything is checked up.

Before attempting to move automobile from freight car have all blocking under car removed, taking due care that no nails are left to puncture or cut tires.

Removing
Blocking

If possible, have an experienced driver handle the automobile when removing from freight car. The emergency brakes will be found set up hard; release emergency brake hand lever in front compartment.

Removing
Automobile
From Freight
Car

MAKING READY TO RUN

One storage battery terminal to storage battery under front seat will be found disconnected; reconnect, and electrical apparatus will be found ready for use. All water is drained from radiator before shipping from factory.

Battery
Terminals

See that pet cocks in water system are closed; one pet cock will be found in cylinder water jacket on left side of engine and another in bottom of radiator.

Filling
Radiator

Fill the radiator with clean water and make sure that radiator is always kept so to prevent engine from overheating and causing unnecessary trouble.

The gasoline tank is located at rear of automobile and has a capacity of 10 gallons.

Filling Gas-
oline Tank

Remove filler cap from gasoline tank in rear of car and insert a funnel equipped with a fine gauze screen. The purpose of the screen in funnel is to prevent any foreign particles from entering gasoline tank which would have a tendency to clog gasoline pipes.

Filling Oil Reservoir

The engine is filled with oil before shipping; however, it is well to test oil level. The oil level indicator, located near the center of engine on right hand side, consists simply of a flat strip of metal which dips into the oil and has marked on its lower end graduations which indicate the height of the lubricant in the pan.

By removing the indicator from tube enclosing it the oil level can be noted and if less than half full cylinder oil should be poured into the opening on left hand side of engine at front end until indicator registers "full."

Operating License

In most cases a license is required before an automobile can be driven on a public thoroughfare; therefore, the new owner should secure a Provincial license or police permit before attempting to do any driving.

Tires

Examine the tires to make sure the requisite amount of air is in them. See detail instructions for tires. Page No. 20.

OPERATING PARTS

(See Figure 1)

Instruments and Control Levers Steering Wheel Horn Button Spark Control Lever and Throttle Control Lever

The various instruments and control levers are shown in Figure 1.

To the left of the driver's position is the steering wheel which controls the course of the automobile.

At the top of steering wheel the electric horn button, spark control and throttle control levers are located.

The electric horn button controls the sounding of the electric horn.

The spark control lever controls the advancing and retarding of the electric spark in the engine.

The throttle control lever controls the speed of the automobile through the carburetor allowing the admission of either small or large quantities of gas to the engine.

Lighting and Ignition Switch Automobile Lock

The electric light and ignition switch is located in front of the driver on the instrument board.

In the center of the switch the lock is located which locks ignition switch in the off position.

This lock assists in preventing the theft of the car.

Carburetor Choker

The carburetor choker is located on the left side of the instrument board in steering post bracket and is used to choke off flow of air to carburetor in starting when the engine is cold. Pull choker button out as far as it will come to fully choke carburetor and after engine starts gradually press button back in place as engine warms up.

Ammeter

The ammeter is mounted on the lighting and ignition switch, the hand of which registers the amount of current charging or discharging the storage battery.

Speedometer

The speedometer is located on instrument board and registers speed of automobile in miles per hour, miles per trip and miles per season.

The knurled button permits trip register to be changed to suit conditions by moving to right or left and giving wheel several turns.

The season mileage can not be changed.

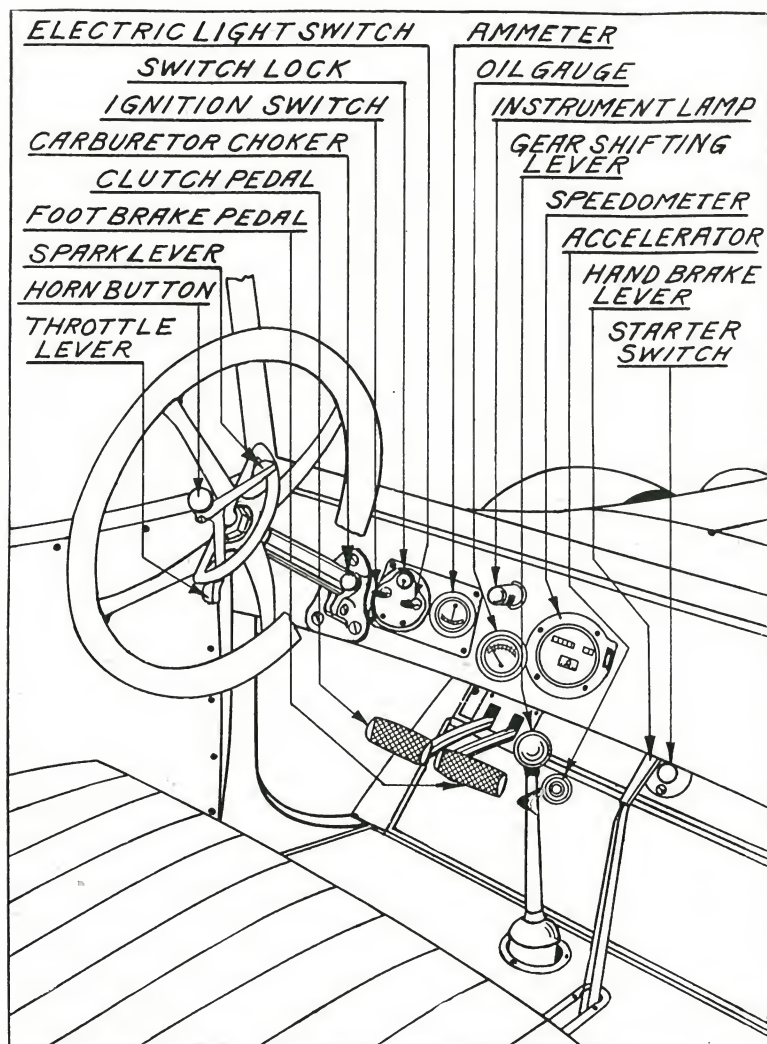


FIGURE 1

View of Instruments and Controls

The clutch pedal is located to the driver's left in the toe board and serves to connect and disconnect the engine and the transmission.

Clutch Pedal

The foot brake pedal is located to the driver's right in the toe board and serves when foot is pressed downward to apply service brake on rear wheels, thus stopping the automobile.

Foot Brake Pedal

The accelerator pedal is located to the right of foot brake on toe board and serves to increase or decrease speed of engine through its connection to carburetor, when driver's foot is pressed downward or vice versa.

Accelerator Pedal

Electric Starting Switch

The electric starting switch is located to the right and above the accelerator pedal and serves when driver's foot is pressed downward to connect storage battery with electric starting motor, causing engine to start.

Gear Shift Lever

The gear shift lever is located in the center of the driver's compartment and serves when shifted to change the speed of the automobile. The different speeds are known as reverse; first; second; and third or high.

Hand Brake Lever

The hand brake lever is located to the right of the gear shift lever and is used to set the emergency brakes on rear wheels, causing the automobile to stop. This brake should always be used when automobile is standing at a curb or on a hill to prevent it from moving.

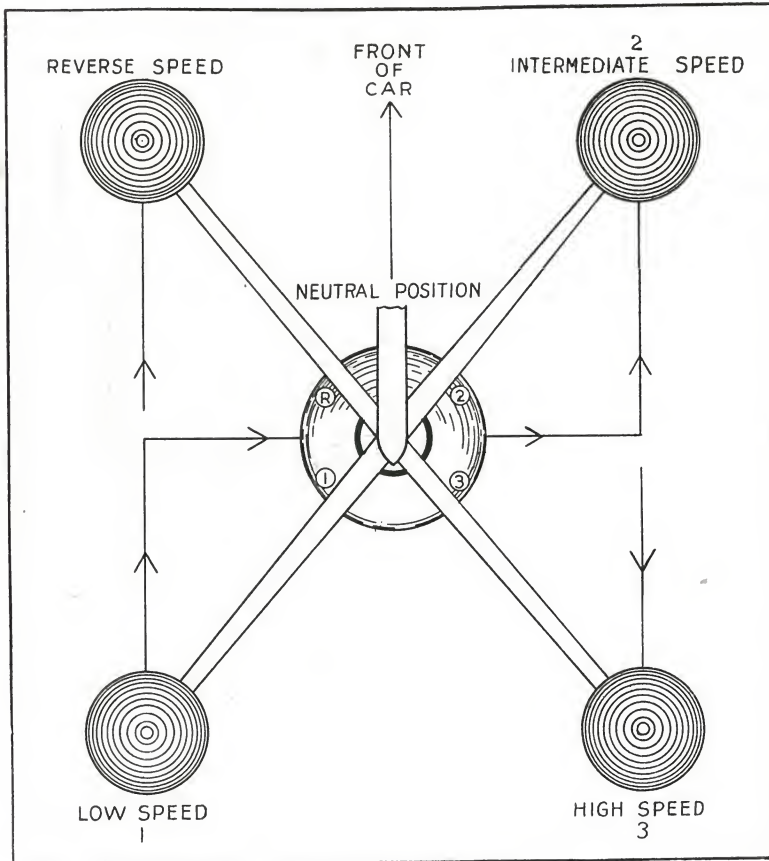


FIGURE 2

Gear Shift Lever Position

Position of Driver and Levers**STARTING THE ENGINE**

Take your position in driver's seat behind wheel. Observe position of hand brake lever and see that it is locked back; also see that gear shift lever is in neutral position (See Figure 2). Place throttle control lever about two inches from bottom of sector and spark control about the middle of the sector.

Pull out choker button as far as possible for cold weather starting. With right hand turn ignition switch button to the right or left.

**Choker Button
Ignition**

With right foot press down on starting switch button and hold foot in this position until engine starts, or about a minute at the most.

**Starting
Switch Button**

Release starting switch button the moment the engine starts, push back choker button as engine warms up, and push spark lever two-thirds of the way up from the bottom of sector. Pull down throttle control lever to prevent engine from racing and always keep it at bottom of sector when driving with the accelerator.

Pull the brake lever back a trifle and release the lever pawl by pressing thumb of right hand down hard; then push brake lever forward until brakes are fully released.

(Never fail to release hand brake lever.) ✓

If for any reason the storage battery should be run down or starting motor fail to work, the engine can be started by hand cranking. Secure starting crank from tool compartment under front seat, remove cap over end of starting crankshaft at front of radiator.

**Hand
Cranking**

Make sure spark is retarded.

Attach starting crank to shaft (handle down) and push toward engine, at the same time turning crank to the right until jaws of crank and shaft lock; then pull up quickly. Repeat this operation until engine starts.

Do not place handle up and press down, as engine might back fire and cause handle to break your arm.

As soon as the engine starts pull down throttle lever until the engine runs smooth and slow. Advance the spark lever two-thirds of distance up from bottom of sector when both levers will be in running position.

**Running
Positions**

Use the foot accelerator pedal to control speed of engine and automobile for ordinary driving and throttle lever when it is desirable to rest the right foot on long runs without much changing of car speed.

OPERATING THE AUTOMOBILE

(See Figures 1 and 2)

Sitting in driver's seat with left hand gripping steering wheel, place right hand on gear shift lever.

**Position of
Driver to
Start First
Speed**

With left foot press down on the clutch pedal (see Fig. 1) as far as possible and at same time move gear shift lever (see Fig. 2) to the left and back toward driver to first speed position.

If transmission gears fail to mesh, place gear shift lever in neutral position again and move clutch pedal up and down a couple of times with left foot; then press way down and gears should mesh properly.

With right foot press gently down on accelerator pedal and at the same time gently release pressure on clutch pedal with left foot when automobile will gradually move forward.

**Moving
Forward in
First Speed**

After automobile has gone some ten or fifteen feet, again press down clutch pedal with left foot and move gear shift lever to neutral; then to right and forward to second speed position.

Second Speed

Third Speed

Repeat operation of releasing clutch pedal and accelerating the speed of the automobile and again press down clutch pedal and at the same time pull gear shift lever straight back to third speed position in which practically all driving will be done.

If gears in transmission fail to engage with each other, move clutch pedal forward and back very slightly with left foot and at the same time pulling back lightly on gear shift lever into third speed.

Running in Third Speed

With automobile running in third speed it is possible to drive from five miles per hour to the maximum speed of car. However, do not attempt speeding until you are very proficient in your knowledge of handling and driving the car, as ten to fifteen miles per hour at first is the best policy to follow.

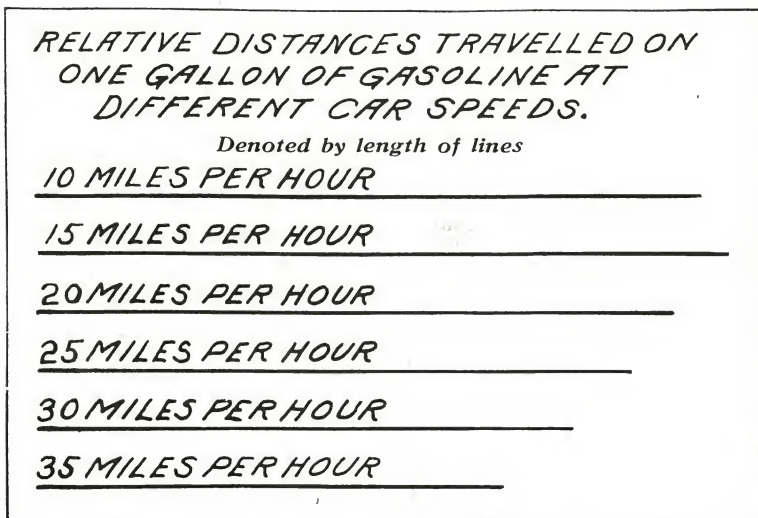


FIGURE 3

Driving Speeds**Economical
Operating
Speed**

The most economical driving speed is between ten and twenty miles an hour; that is, the car can be driven more miles for each gallon of gasoline consumed at those speeds than at any other speed.

Figure 3 shows this clearly.

**Stopping the
Automobile**

Retard the spark and at the same time remove foot from accelerator (this will cause the engine to slow down and act as a brake upon the car speed). After car speed is thus reduced, disengage the clutch with the left foot and at the same time apply the brakes with the right foot. With both feet pressing down on pedals, move gear shift lever forward to neutral position and set the hand brake.

**Stopping the
Engine**

With right hand turn the ignition button to "off" position when electric current to spark plugs will be cut off, causing engine to stop. Remove switch key and car will be locked to assist in preventing theft.

**Running
Automobile
Backward**

Note previous instructions on first speed except that shift lever moves to left and forward for reverse. Be careful not to back up too rapidly at first. See Figure 2.

In shifting gears from one speed to another the motions should be made with firmness and dispatch. If the gears fail to mesh at first and a grinding noise is heard, don't continue to push or pull on gear shift lever. Gradually work clutch pedal ahead and back so gears will change their relative positions and then move shift lever to desired position.

Shifting Gears

Never attempt to shift from first to reverse or vice versa while car is moving.

DRIVING OPERATIONS, RULES AND SUGGESTIONS

While driving the McLaughlin Model H-63 always try to bear in mind the fact that you are the one who controls the entire situation, and that the car will do what you wish it to. Keep cool headed.

The Driver and Car

Don't try any speeding. Drive slowly at first and be sure you have learned to handle the car under all conditions before attempting any speed records. Watch your speedometer and don't let it get above fifteen miles per hour; keep your feet near the clutch and brake pedals and learn to handle the hand brake lever for emergencies.

Don't Speed

From time to time glance at the oil indicator (see Figure 1) to see that oil is circulating. For proper pressure see Figure 8.

Circulation of Oil

Take notice that the hand brake lever is pushed as far forward as possible so that the car can run freely and not cause brake linings to burn out.

Release Hand Brake Lever

Watch the road ahead and learn to observe objects at a distance as well as close to prevent any chance for an accident.

Watch the Road Ahead

Turning the steering wheel to the right causes the car to go in the same direction and vice versa.

Turning the Steering Wheel

Learn to turn the steering wheel gradually (not suddenly), thereby causing the car to keep an even straight course ahead or backward.

With the spark and throttle control levers set in running position and while driving with right foot on accelerator, should you wish to stop the car, remove the right foot from accelerator pedal and press gradually down on foot brake pedal; at same time retard spark lever and press down on clutch pedal and with right hand move gear shift lever to neutral.

Stopping the Automobile

Never race the engine, as this does no good and might do serious harm.

Racing Engine

One of the things which causes some doubt about any automobile is the shifting of gears, but with a little practice it is soon learned. Follow out instructions already mentioned and at same time observe the speedometer. For instance, in starting with clutch pedal pressed down, accelerate the engine a little after shifting from neutral to first and at same time gradually (never sharply) release clutch pedal, and when the car is moving at three to five miles an hour press down on clutch pedal and return the gear shift lever to neutral and then to second speed.

Practicing Gear Shifting and Steering at Various Speeds

After second speed is reached, again accelerate engine and when car is moving, say ten to fifteen miles per hour, again press down on clutch pedal and move gear shift lever to third speed, then again release pressure on clutch pedal, when by pressing down on accelerator pedal all speeds from five to maximum can be obtained.

Locate a roadway where traffic is not crowded and practice gear shifting, bringing car to full stop, then going ahead again, then stop-

ping and backing up, then turning corners, and you will discover in a very brief amount of time that driving a car is quite simple.

Skidding

If rear end of car skids to the right, turn steering wheel slightly to right, and if it skids to left, turn steering wheel to left. Retard throttle lever at once and press down on foot brake pedal until engine and car speeds are normal, then release clutch by pressing down on clutch pedal with left foot. The principle thus described is to use engine as a brake in connection with brakes on rear wheels and in doing so the rear wheels are permitted to revolve slowly until they stop after disengaging the clutch; thus the entire periphery of tire is used as a brake against the ground and no one spot on tire can become slippery to assist the skidding action of the car.

Ordinary hills do not affect the McLaughlin H-63 and require no special attention.

Hill Climbing and Low Speed Controls

When approaching a very steep hill, speed up the car, and as momentum decreases retard spark control lever and if car still slows down change gear shift lever to second and, if necessary, first, speed position. Don't let clutch slip by pressing on clutch pedal, as this will soon wear out the clutch cone facing. The car can climb in first speed any hill that can be climbed by a car, so don't feel afraid to use the lower speed controls and by so doing save the car from undue strain as much as possible.

When stopping on a hill use foot brake pedal with clutch pedal pressed down and at the same time pull hand brake lever hard up, after which move gear shift lever to neutral and release clutch pedal. Don't leave the car on a steep hill without blocking rear wheels, and also set front wheels so that in case car does move it will back against side of road.

Going Down Hill

In driving down hill, rather than apply brake, shift back to lower gear speeds, take foot off accelerator and pull down throttle lever, leaving clutch engaged with fly wheel, and by so doing use the engine as a brake, which does not cause any extra wear on the car and saves the brake linings.

Starting Car on Hill

In starting a car on a hill first press down hard on foot brake and clutch pedals and move gear shift lever to first speed, then speed up engine a little with throttle lever on steering wheel, after which gradually release hand brake lever, foot brake pedal and clutch pedal, when car will start to move forward as desired.

Saving Brake Linings

When stopping on level road brake linings may be saved by using engine as a brake as follows:

Retard spark and throttle levers as much as possible and take foot off accelerator pedal. When car is nearly at desired spot push down clutch pedal and apply foot brake. Before releasing clutch pedal move gear shift lever to neutral.

Rules of the Road

Every driver of a motor car should understand and obey the rules of the road. Briefly stated, they are as follows:

1. When meeting a vehicle going in the opposite direction, turn out to the right.
2. When passing a vehicle going in the same direction, sound the horn and turn out to the left.

N.B.—In the Maritime Provinces and certain parts of British Columbia, Rules 1 and 2 are reversed. Follow local practice in every case.

3. In turning a corner to the right, keep as close as possible to the right-hand ditch or curb.

4. In turning a corner to the left, always continue on past the center of the intersection of the two roads or streets before making the turn.

5. In stopping the car, always stop at the right-hand curb.

6. In meeting another car at night, always dim headlights.

1. Don't drive your car until you have read the instructions in this book, as well as those contained in the Remy, Prest-O-Lite and Stewart-Warner Instruction Books.

Don't's

2. Don't drive fast.

3. Don't drive with your foot on the clutch pedal.

4. Don't let clutch in suddenly.

5. Don't lock rear wheels with brakes except in emergencies.

✓ 6. Don't use starter more than half a minute at one time.

7. Don't race motor when idling.

8. Don't use brakes on a long down grade; use engine as a brake, as explained on pages 11 and 13.

9. Don't turn off ignition when using engine as a brake.

— 10. Don't drive on a level road with spark retarded.

11. Don't drive on a flat tire.

12. Don't leave car standing any length of time in freezing weather without draining radiator and engine water jacket.

13. Don't neglect to oil bearings as shown in oiling chart.

14. Don't leave your headlights on bright when passing another vehicle at night; use dimmer.

15. Don't try to make any adjustments or repairs unless you are sure you understand just what to do.

— 16. Don't forget to look at your storage battery once a week.

17. Don't forget to see that your headlights are set and focused correctly.

18. Don't fail to fully release hand brake lever.

19. Don't fail to set hand brake lever upon stopping.

20. Don't leave your car without locking switch.

All of the electric lights are controlled by electric light button.

Turning the button to the right causes all lights to burn bright and turning button to the left causes all lights to burn dim.

Using the
Lights

Most city and town ordinances require that headlights be dimmed, which is beneficial to other drivers and does not use so much current from the battery.

Headlights may be focused to comply with local or state regulations. This is accomplished by turning the knurled terminal at rear of headlight in a counter-clockwise direction about a quarter of a turn and sliding it in or out. When proper focus is secured let terminal spring back into place.

Focusing
Headlights

PART TWO

INTRODUCTORY.

Part two introduces the reader to various subjects pertaining to the maintenance of the particular car.

The subjects taken up under this heading are functions, care, adjustments and repair of parts and are divided into the following chapters:

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On the other hand the car frequently requires the most power when it is moving slowest, as when pulling up a steep hill or through sand or mud. At such times the requirements of the car for power to be delivered at a low rate of speed are directly opposed to those of the engine which will deliver more power only at a higher speed.

It is the transmission change speed gears which overcome this apparent difficulty by changing the ratio between the speed of the engine and the speed of the rear wheels.

Engine Power
and Car Speed

Change Speed
Gears

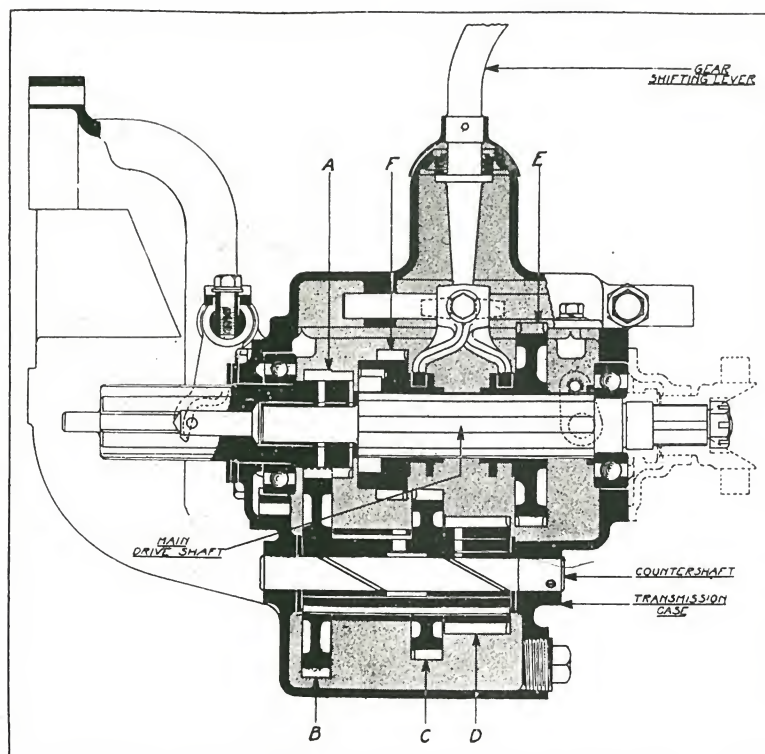


FIGURE 14

Sectional View of Transmission

The McLaughlin Light Six is equipped with a selective sliding type transmission mounted as a unit with the engine. It consists essentially of two shafts mounted one above the other in an oil-tight casing, as shown in Figure 14. On the lower, or countershaft, are three gears of different sizes, "B," "C" and "D," all of which revolve together. The upper shaft is divided between gears "F" and "A" and these two gears are free to turn independently of each other. The rear "A" connects at its forward end to the clutch and the shaft on which gears "F" and "E" slide is connected in the rear to the propeller shaft. Gears "F" and "E" are fitted to the splined part of this shaft and have grooves in their hubs to receive the shifter forks by which they are moved back and forth along the shaft. At one side of the lower shaft is mounted two gears, "G" and "H," not shown in cut, one of which is constantly in mesh with gear "D" on the lower shaft.

Type of
Transmission

Transmission
Units

Neutral Position

As shown in Figure 14, the sliding gears "F" and "E" are in neutral positions, meaning that neither of these gears are in mesh with any other gear. When the clutch is engaged with flywheel, gear "A" turns with the engine. Gear "A" and "B" are always in mesh, and are known as fixed reduction gears. Since all the gears on the lower shaft are connected to gear "B" they all turn as a unit.

To cause the engine to turn the rear wheels and start car it is necessary to shift the gears into operation as follows:

First Speed Position

When the gear shift lever is moving to first speed, gear "E" moves forward until it is meshed with gear "D." Now the power of the engine is transmitted through gears "A," "B," "D" and "E" to the propeller shaft, rear axle and rear wheels, and both gears "A" and "E" turn in same direction, though at different speeds.

Second Speed Position

As the car gains speed, less power is required to drive it; the gear shift lever is moved to the second speed position and gear "E" is moved back out of mesh and gear "D" to position shown in Figure 14, and gear "F" is moved backward into mesh with gear "C." The power is now transmitted through gears "A," "B," "C" and "F."

Third Speed Position or Direct Drive

Gear "F" is provided with internal teeth cut on its front face and when gear has gained sufficient headway the gear shift lever is moved to third speed position and gear "F" moved out of mesh with gear "C" and slips into mesh with gear "A." This locks the two parts of the upper shaft solidly together and both turn to the right at the same speed, transmitting the engine power direct through propeller shaft and rear axle to the rear wheels. The gears on the countershaft continue to turn, but without doing any work. In this position the transmission is said to be on direct drive and the engine crank shaft turns $4\frac{1}{2}$ times for each revolution of the rear wheels, which is the standard gear ratio or reduction of the rear axle.

Gear Ratio**Reverse Speed**

To reverse the motion of the car the gears are all set back to neutral and gear "E" is moved back to mesh with gear "H," which is already meshed with gear "D" and "G." Power is now transmitted through gears "A," "B," "D," "G," "H" and "E," in the order named. Gear "A" revolves to the right, gear "B" and "D" to the left, gears "G" and "H" to the right, and gear "E" to the left, thus reversing the motion of the propeller shaft.

Alloy Steel Gears

The transmitting gears are made of unusually strong alloy steel which have short, strong teeth. The teeth are beveled on the edge to make them move into mesh with each other more easily, but care must be taken to always release the clutch before shifting gears "F" and "E" to prevent the rapidly moving edges of teeth from grinding against each other before they move into mesh.

Care in Shifting Gears**Position of Gear Shift Lever**

As already noted, the gear shift lever controls the movement of gears "F" and "E." For further reference to gear shift lever positions, see Figure 2.

Attention of Transmission

Beyond lubrication, the bearing shaft, gear shifter rods and gear shift lever requires no attention.

Repairs

To make any repairs to speed shift lever and shifter rods the upper part of transmission can be moved by taking out several cap screws. However, to make any repairs to lower part of transmission it will be necessary to disconnect the transmission case from the engine and propeller shaft.

Lubrication

The lower part of the transmission case is always kept filled with lubricant and the gears on the countershaft, which runs in it all the time, distributes it on the other gears and bearings. The amount of lubricant necessary can be determined by lubricant level

plug on left side of transmission case. During summer use 600 W. or a lubricant of similar consistency. During cold weather use a mixture of 50% 600 W. and 50% motor oil. This is important, as if 600 W. were used alone it would be thrown out against the walls of transmission case by the revolving gears and leave the gears and bearings without lubrication. The lubricant can be removed by removing pipe plug in the rear of transmission case.

For further information on lubrication, see General Lubrication and Figure 4, Lubrication Chart.

UNIVERSAL JOINTS AND PROPELLER SHAFT

(See Figure 15)

Universal joints and propeller shaft are used to connect and distribute power from the engine and transmission to the rear axle and road wheels.

The Universal joints and propeller shaft to the McLaughlin H-63 consists of one universal joint fastened to the rear end of the transmission shaft. Sliding in the rear end of this joint is the propeller shaft and to the rear of the propeller shaft is another universal joint which is fastened to the front end of the rear axle drive pinion shaft.

The universal joints in connection with the spline-ended propeller shaft serve to compensate for the inequalities in the positions of the fixed transmission and the moveable rear axle. Some attention should be given to the universal joints to see that they are securely fastened at both ends of the propeller shaft to the hubs which are fastened to the shafts of the transmission and rear axle.

The universal joints and spline portion of front joints should receive lubrication. For reference to lubrication, see Figure 4, and lubrication schedule. Aside from the above remarks the universal joints and propeller shaft require no attention.

To remove universal joints and propeller shaft to make any repairs it is only necessary to remove the bolts in the front and rear universal joints, when the entire assembly can be removed from the car.

Use of Joints and Shaft

Description of Joints and Shaft

Attention to Joints and Shaft

Lubrication

Removing Joints and Shaft

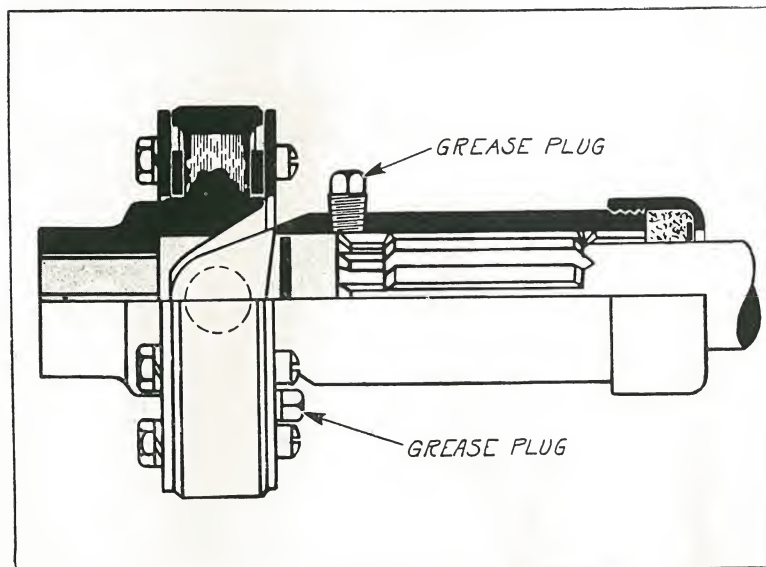


FIGURE 15

Universal Joint and Propeller Shaft

REAR AXLE

(See Figure 16)

Use of Rear Axle	The rear axle serves to transmit power from universal joints and propeller shaft to rear wheels, and at the same time forms a support for the rear end of the car.
	The rear axle consists essentially of the driving shaft, drive pinion, differential, axle shafts, rear hubs, service and emergency brakes and housings and several bearings, upon which the movable parts are mounted.
Third Member Unit	The drive pinion shaft is mounted in two ball-bearings, the whole being mounted in what is known as the third member housing. This assembly is bolted to the differential housing.
Differential	The differential consists of a ring gear, together with a housing which is split to receive the differential gears, the whole assembly being mounted in two roller bearings, which in turn are supported by the differential housing. Thrust bearings are placed in both ends of differential case to take up thrust between the drive pinion and ring gear.
Reasons for Differential	The differential serves to compensate for difference in distance traveled by one wheel against the other when the car runs in a circle.
Axle Shafts	The axle shafts are fastened to two of the differential gears with castle nuts and at the outer end are fastened to the hubs, each hub being held in place by a key and nut. The nut is prevented from turning by a washer which has a tongue entering key way; also lips, one of which is bent over to hold the nut.
Mounting of Rear Wheel	The rear wheel hub is mounted on one roller bearing which in turn is mounted on the axle tube, thereby causing the full load of rear end of car to come on the axle tube instead of the axle shaft, the result being that the axle shaft serves to drive the wheels and does not carry any other load.
Brake Shaft Brackets	To the outside of axle housing are brackets which support the service and emergency brake shafts.
Service Brake	The service brake, which is used almost entirely and is operated by the foot brake pedal in the driver's compartment, consists of a steel band with a special brake lining. When the pedal is pressed down the bands are contracted against a brake drum on the rear wheel.
	The emergency brake is operated by a hand lever in the driver's compartment.
Adjustment of Emergency Brakes	Provision for the adjustment of emergency brakes is taken care of by a "V" shaped nut on front end of front emergency brake rod. See Figures 17 and 18 for further reference to service and emergency brakes.
Adjustment of Driving Pinion	To adjust driving pinion and ring gear loosen lock which holds front bearing sleeve in front end of third member and by turning the bearing sleeve to the right the driving pinion moves toward ring gear, thereby taking up any back lash in the teeth of these two gears; turning bearing sleeve to the left withdraws driving pinion from ring gear, causing back lash to increase or make more clearance between the teeth of these gears. This adjustment can be made without removing rear end universal joint. To remove entire third member assembly it is necessary to disconnect rear universal joint and remove the several nuts and lock washers from studs in the rear axle housing.
Removing Third Member	

No adjustments of the differential are required.

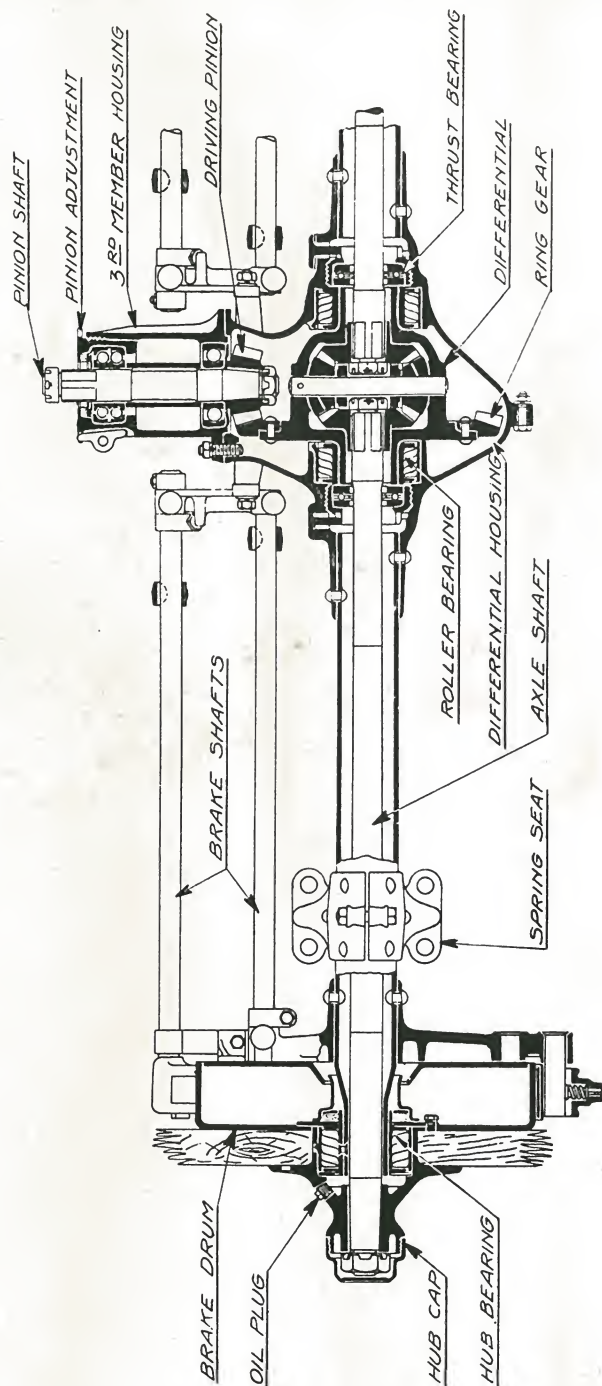


FIGURE 16
Sectional View of Rear Axle

Removing Differential	To remove differential from rear axle housing remove the entire rear axle from the car and disassembly can be taken care of at this point. For reference, see Figure 16.
Reassembling Rear Wheels	To remove either of the rear wheels secure auto jacks and jack up rear end of car so that wheel or wheels clear the ground, secure hub cap wrench from tool kit and remove hub cap; then press back the lip of lock washer and remove axle shaft nut. See that the emergency brake is released, and by gripping spokes with both hands the wheel hub should slide off end of axle shaft. The outer end of axle shaft and inside of rear wheel hub are tapered and, as noted before, the hub is held from turning by a key between hub and axle shaft. When reassembling rear hub on axle shaft secure an oil can and cover the outside of shaft taper with oil, and with the end of your finger distribute this oil evenly over this entire surface. This will prevent rear wheel hub from becoming rusted on axle shaft.
Lubrication of Rear Wheels	A pipe plug is provided in third member of rear axle to permit of lubricating the two bearings of the driving pinion shaft.
Lubrication of Rear Axle Parts	A pipe plug is provided which admits of lubricating the differential gears, roller bearings and thrust bearings in rear axle housing. During summer use 600 W. or a lubricant of similar consistency. During cold weather use a mixture of 50% 600 W. and 50% motor oil. This is important, as if 600 W. were used alone it would become stiff with the cold and be thrown out against the walls of the differential case by the revolving gears and leave the gears and bearings without lubrication. A pipe plug is provided in the rear wheel hub to permit of lubricating rear wheel roller bearings. To permit of lubrication of service and emergency brake shafts grease cups are provided. For further reference to instructions for the lubrication of the rear axle, see Figure 4, and lubrication schedule.
Squeaking Brakes	To prevent service brakes from squeaking when foot brakes pedal is applied, secure an oil can filled with gasoline and squirt the gasoline on the service brake lining its entire length.

FRONT AXLE

(See Figure 19)

Front Axle Parts	The front axle carries the weight of the forward part of the car and at the same time allows the front wheels to turn in response to the action of the steering gear, so that the car may be guided along the road. It consists essentially of a drop forged steel beam with bearings at each end. Steering knuckles fit over the bearings and turn on king bolts which hold them in place. The wheels revolve on spindles which form a part of the knuckle, and are carried on two rows of ball bearings in each hub. To the knuckle are attached steering arms, which are connected together behind the axle by the tie rod. The left hand knuckle has a third arm, which ends in a steel ball, and this is connected to the drag link, which in turn is connected to the steering gear pitman arm. When the steering wheel is turned the drag link moves ball-ended third arm forward and back, at the same time swinging the steering knuckle spindle and wheel in an arc about the king bolt. As the left wheel swings it acts on the right wheel through the tie rod and compels it to swing in the same direction. On account of the steering arms being set at an angle the two wheels do not swing an equal amount, because the outer one has to travel a slightly larger circle than the inner one. The axle is suspended from the frame by the front springs, which are clipped to the spring pads of the axle I-beam.
Action of Front Wheels	It will be noticed that the front wheels do not stand quite straight, but that they are closer together at the bottom than at the top, and that they are toed in slightly at the front; the amount of the top divergence from the vertical is known as the "camber" and the amount that toes in as the "gather" of the wheels. The camber
Camber and Gather	

causes the point of road contact to fall more clearly under the center of the king bolt and thus make the car steer easier, while the gather is to offset the effect of the camber and makes the tires wear more evenly.

To get the proper amount of gather the front wheel should measure $\frac{3}{8}$ of an inch closer at the front than at the rear. These measurements are between the inner edges of the rims.

If the tie rod or steering arm should become bent the amount of gather may be adjusted by removing the bolt in the tie rod joint and turning the yoke to the right or left as may be necessary, and then replace yoke on steering knuckle together with bolt and nut. (See Figure 19.)

To remove the wheel unscrew the hub cap, take out cotter pin, unscrew the nut on end of spindle and take off the safety washers. The wheel can then be pulled off.

When putting the wheel back on, care must be taken to properly adjust the bearings, the cones should be drawn up by the nut until there is no side play of wheel, and at the same time the wheel should revolve freely. This adjustment is very important, as the bearings will be short lived if they are either too tight or too loose.

Grease cups are provided to lubricate king bolts and tie rod. To lubricate wheel bearings it is necessary to remove the wheel and pack bearings in grease.

For further information on lubrication and front axle, see Figure 4 and lubrication schedule.

STEERING GEAR

(See Figure 20)

The steering gear controls the front axle by turning the steering wheel to the right or left. The McLaughlin H-63 steering gear is semi-reversible. It is irreversible as far as shocks are concerned, as the shock of striking a stone or bump in the road will not be transmitted to the steering wheel. You can, however, feel or follow your way in ordinary road ruts and gradual turns, this making an ideal condition when driving the car.

Adjustment of Tie Rod

Removing Front Wheels

Adjustment of Bearings

Lubrication

Semi-Reversible

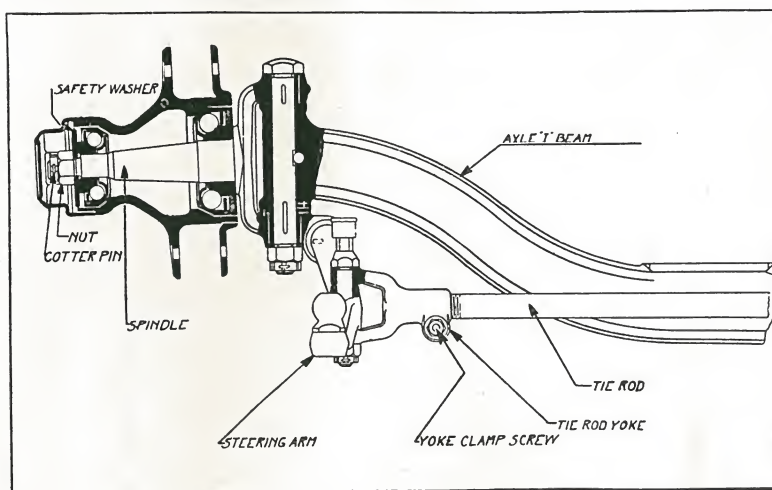


FIGURE 19

Sectional View of Front Axle Hub

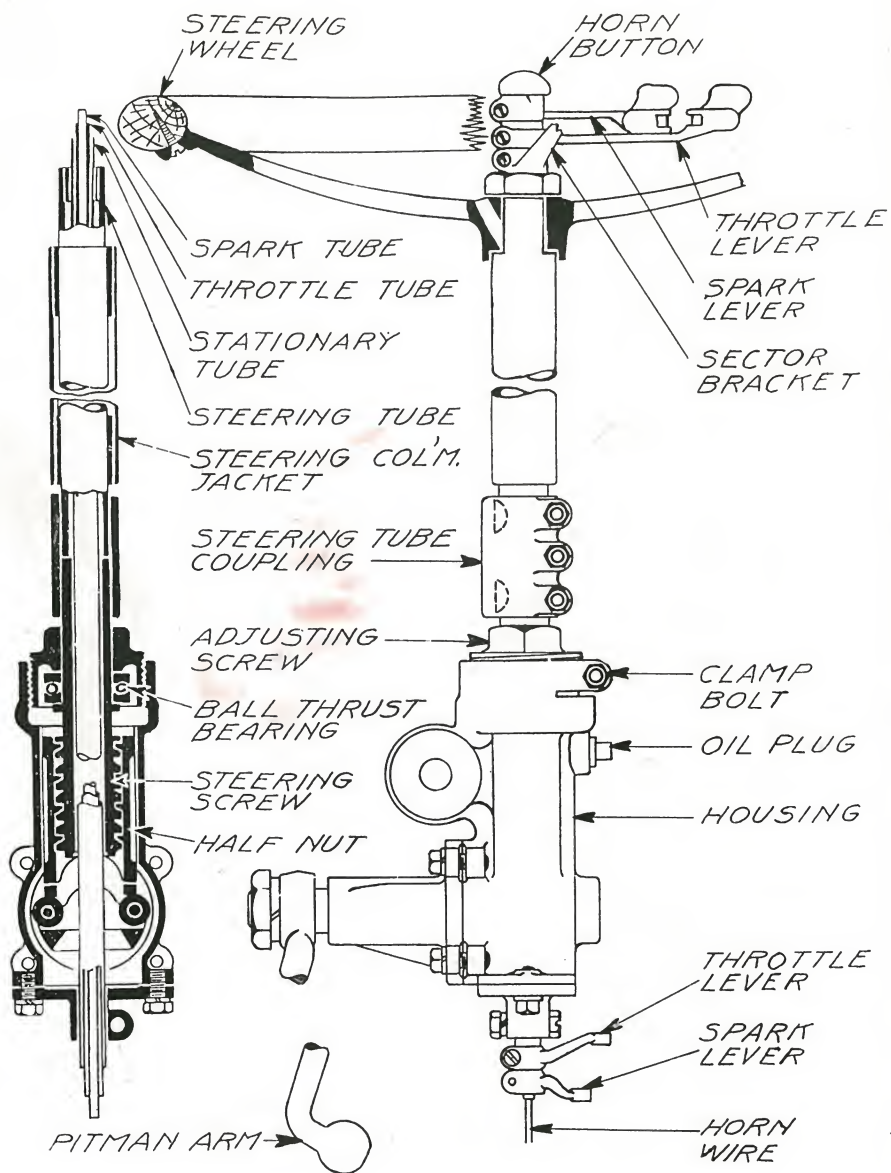


FIGURE 20
Outside and Sectional View of Steering Gear

The steering gear is of the double-threaded screw and half-nut type.

The steering gear consists essentially of the steering tube to the upper half of which is attached the steering wheel, while at the lower end of the double-threaded screw and half-nuts are located. The double-threaded screws and half-nuts are contained in a housing, one of the half-nuts having a right-hand thread and the other a left-hand thread. The ends of the half-nuts bear against two rollers attached to a yoke on a short shaft which projects outside of the housing; to the end of this shaft a pitman arm is attached, which is connected to the drag link, which in turn is connected to the third arm on the left hand side of the front axle. Turning the steering wheel to right or left also turns the tube end screw in the same direction, and as the screw turns one of the half-nuts rises while the other descends. This pushes one roller down and allows the other to rise, then turning the shaft and imparting the desired motion to the pitman arm, and so on to the road wheels. Inside of the steering tube are located a stationary tube, throttle control tube and spark control tube. Within the spark control tube an electric wire is located which controls the sounding of the electric horn. This steering gear is adjusted to all wear by one single adjustment. Excessive back lash or loose motion can be taken up by loosening clamp bolt and screwing down on adjusting screw. (See Figure 20.) Care should be taken to see that the gear is not adjusted too tightly. All loose motion apparent in the steering wheel is not always due to the steering gear. The drag link and tie rod should also be examined when making those adjustments. After adjusting steering gear, lock the adjustment nut again with cap screw. Aside from seeing that all the screws, nuts and bolts are securely tightened and too much play in steering wheel is not permitted, the steering gear will require no other attention. A pipe plug is provided in the steering gear house for the lubrication of movable parts within. The several tubes are fitted with small bushings, which require only a few drops of oil occasionally; this can be accomplished by dropping oil through oiler which is inserted in the steering wheel.

For further reference to lubrication, see Figure 4 and lubrication schedule.

ROAD SPRINGS

Road springs are interposed between the front and rear axles and the frame to absorb any shocks before they can be transmitted to the upper mechanism or passengers. These springs consist of thin layers or leaves of steel graduated in length and lying one on top of the other, the longest or master leaf being fastened to the frame by bolts and shackles. The springs are held down to their seats by spring clips which pass around them near the center of spring, passing through the axle pads, and are held in place by nuts and lock washers. A small bolt passes through the spring leaves in the center of axle pads. This bolt holds the leaves from shifting longitudinally. Small clips hold the leaves together near their ends. Extreme care should be exercised at all times to see that the spring clip nuts are screwed up tight, as the center of the spring is usually the point of greatest stress, and should the spring clip become loose it may cause one or more leaves to break at this point. The bolts which fasten the springs to the frame are fitted individually with grease cups by which are joints are lubricated, and if squeaking develops in spite of this constant lubrication it is desirable to introduce a lubricant between the spring leaves. This is done by jacking up the frame of the car and inserting the lubricant between the leaves after the leaves have

Type of
Steering Gear

Action of
Screw and
Half-Nuts

The Various
Tubes

Adjustment of
Steering Gear

Lubrication

Spring
Construction

Adaption of
Springs and
Fastenings

Keep Clips
Tight
Lubrication

been sprung apart by a screw driver or some other mechanical contrivance.

WHEELS

The wheels of the McLaughlin H-63 are of the standard artillery type in which the spokes all meet in the center and are bolted between the flanges of steel hubs. On the outer rim or felloe is shrunk a steel band, known as the felloe band, which forms the foundation for the demountable rim. Beyond keeping the wheels clean and free from mud and oil, they require no other attention.

RIMS

(See Figures 21 and 22)

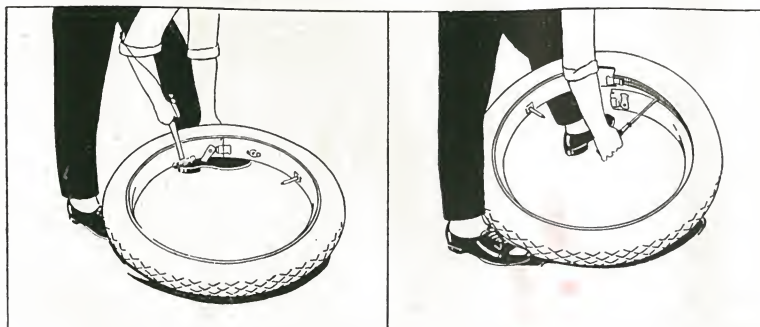
- | | |
|--------------------------------|---|
| Type of Rim | The McLaughlin H-63 is equipped with Perlman bolted-on type of demountable rim, which may be removed from the wheel. The rim consists of a split steel band flanged to fit the base of the tire, which is slipped on over the steel felloe band and held by several bolts and nuts and taper wedges located at equal intervals about the circumference of the wheel. |
| Advantage | The advantage of this arrangement is that a punctured tire may be removed, rim and all, and replaced with a fully inflated one already attached to its rim without pumping or removing the tire from the rim. |
| To Remove Rim | To remove the rim, jack up the car and with rim wrench provided for this purpose unscrew all of the nuts and loosen the wedges, after which use a wrench or pair of rliers to remove the cap which covers the tire valve stem. Turn wheel until the valve stem is on top, and by adjusting wedges so as not to interfere with demountable rim, pull the rim from the wheel at the bottom first, and lift the tire and rim to clear valve stem, when the tire and rim will be free from the wheel. |
| To Replace Rim | To replace rim and tire reverse the foregoing instructions and be sure to securely tighten the nuts and wedges which hold the tire and rim in place. |
| To Remove Tire from Rim | To remove tire from rim, first lay rim and tire flat on the ground, and with hammer loosen the locking plate as shown in illustration, see No. 1 (Figure 21).

Then beginning at the end of rim farthest from the valve stem, pry rim off from tire with a screw driver, see No. 2 (Figure 21), and continue this every few inches until the rim easily slips out of tire. |
| To Replace Tire on Rim | To replace tire on rim, first sprinkle some talc in tire casing to prevent tube sticking, and with tube slightly inflated press into casing evenly all around. Be sure rim is unlocked. Place rim flat on the ground with locking plate pointing up. Raise rim at point where it is drilled to take the tire valve stem, and put valve stem from tire through this hole and fit tire casing onto rim as far around the rim as possible, see No. 3 (Figure 22).

Then lay the tire and rim flat on the ground and hook the upper edge of the free end of rim inside groove in lower edge of the end already fitted on the tire.

Begin at the point where tire fits into the rim and with screw driver pry casing over edge of rim, as the same time pressing tire into place with foot as shown in illustration, see No. 4 (Figure 22).

Continue this until tire completely slips into rim and with hammer tap locking plate back into place. Tire may be inflated and placed on wheel or on tire carrier. |



No. 1

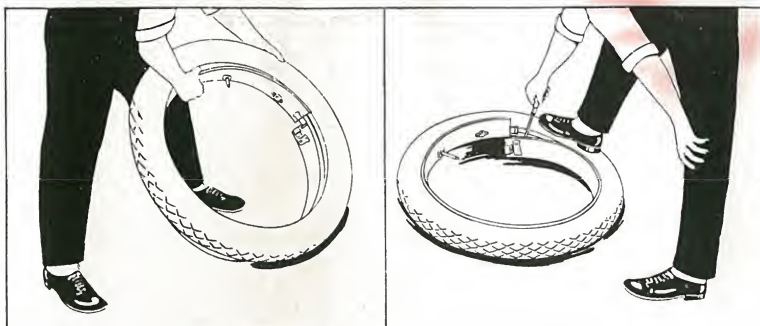
No. 2

FIGURE 21
Removing Tire from Rim

CAR BODY

The body is the passenger carrying part of the car and consists of a steel shell into which are fitted the seats and cushions. It is bolted to the frame and may be removed entirely without disturbing any of the mechanism of the chassis.

There are no moving parts attached to the body and it will require no attention or adjustment beyond an occasional inspection to make sure all bolts are tight and in good order. This is important.



No. 3

No. 4

FIGURE 22
Replacing Tire on Rim

THE TOP

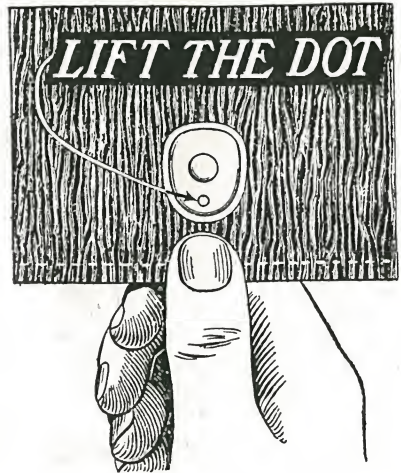
Always leave the top up until it gets thoroughly dry before attempting to fold it. When folding be careful to see that the cloth is not pinched between any of the bows, or they will wear a hole in it very quickly. Always put the slip cover on when top is folded to keep out dust and dirt. The top is of the one-man type, and by loosening thumb screws which fasten same to the windshield and lifting front bow, the top automatically recedes back into a folded position. "Lift the Dot" fasteners are used to hold the side curtains in place. When dot is next to the edge of curtain the natural way is to lift edge of curtain, when curtain will be pulled away from the screw which holds it.

Dry Before
Folding

Fasteners

**"LIFT THE DOT"
FASTENER**

The "Lift the Dot" Fastener is used to fasten the side curtains in place. To remove fastener from over stem, grasp the curtain just below the fastener, as shown in cut, and give it a sharp, quick jerk.



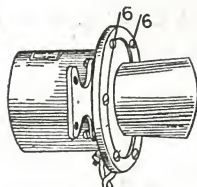
Speedometer

For instructions on how to care for speedometer, see Stewart-Warner Speedometer Corporation's Speedometer Instruction Book.

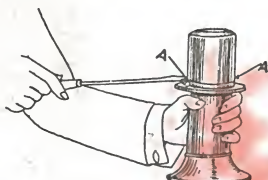
ELECTRIC HORN

The motor driven electric horn is of sturdy construction and if the following instructions as to care are followed it will give long and continuous service.

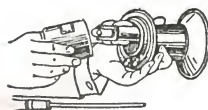
TO CLEAN AND LUBRICATE



The six screws 6-6 attaching collar and projector need never be removed. If this is done be sure that they are screwed in tight when replaced.



First take out the two screws A-A



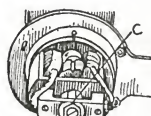
and then remove back shell.



1—Take a dry cloth and wipe the commutator clean



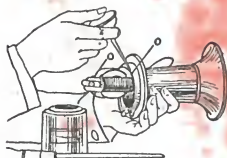
2—After commutator is thoroughly clean, apply a little vaseline or non-fluid oil to a clean part of the cloth. In cold weather use thin oil.



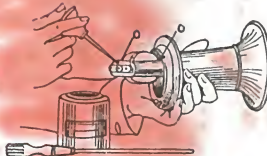
The commutator is shown at C in this illustration.



3—Then apply this to the commutator. The slightest film of lubricant is sufficient. An excess obstructs the flow of current.



Once a month a few drops of cylinder oil should be dropped into the two oil wells O-O shown in illustration. In cold weather use light machine oil.



TO ADJUST

First loosen lock-nut.

To do this apply wrench as shown in Figure I. Turn to position shown in Figure II

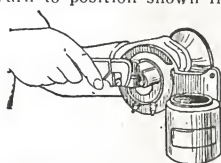


Figure I.—This illustration shows position of wrench when first put on lock-nut.

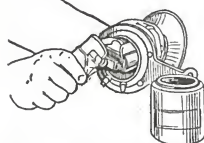
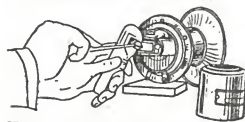
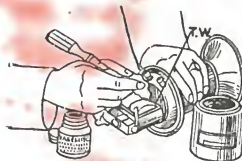


Figure II.—This illustration shows position of wrench after lock-nut has been loosened.

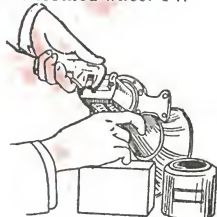
Then—after lock-nut is loose—start the current by pressing the push button. In other words, sound the signal. While it is sounding unscrew adjusting screw until no sound is heard except the buzzing of the motor. Then turn screw back until the note is loud and clear.



This illustration shows adjusting screw being unscrewed with a screw-driver. The wrench is holding loosened lock-nut.



Every three or four months a little non-fluid oil or vaseline should be applied to the toothed wheel TW



When note is loud and clear tighten lock-nut. Be sure to set it uptight

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